

FACT SHEET FOR NPDES PERMIT WA-0045241
SOLAR GRADE SILICON, LLC
INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	Solar Grade Silicon, LLC
Coapplicant	Advanced Silicon Materials, Inc.
Facility Name and Address	Solar Grade Silicon, LLC 3322 Road "N" N.E. Moses Lake, WA 98837
Type of Facility	Production of High Purity Silicon
SIC Code	3339
Discharge Location	Waterbody name: Rocky Coulee Drain via Drain DE 226 Latitude: 47° 08' 05" W. Longitude: 119° 12' 22" N
Treatment Plant Receiving Discharge	City of Moses Lake POTW (Sand Dunes Treatment Plant)
Water Body ID Number	WA 41-1140

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BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

Solar Grade Silicon, LLC produces high purity polysilicon at its facility in Moses Lake (see Figure 1). The processing plant has been at the location since the early 1980s. The Union Carbide Corporation first built and operated the facility. Advanced Silicon Materials, Inc. (ASiMI) acquired the operations in early 1990. In 2002, ASiMI entered into a joint venture with Solar Grade Silicon, LLC for operation of the facility. Under the joint venture agreement, Solar Grade Silicon, LLC assumed all discharge permit responsibilities.

The high purity polysilicon has historically been used to make semiconductors. Under Solar Grade Silicon ownership, the polysilicon is used for photoelectric cells. ASiMI still retained limited finishing operations at the site. These operations consist of polysilicon rod milling, etching, filament production, and an analytical laboratory.

INDUSTRIAL PROCESS

High purity polysilicon is produced at the site by the thermal decomposition of silane (SiH_4). This decomposition occurs in reactor vessels using electrically heated silicon filaments. Silane is produced onsite by the reaction of metallurgical grade silicon with hydrogen and silicon tetrachloride. A portion of the silane is also sold directly as product.

Within the facility, process wastewater is segregated into low chloride and high chloride waste streams. The low chloride wastewater is generated from supply water treatment (ion exchange backwash), rinsing of the reactors, and miscellaneous process area floor drains and wash areas. High chloride wastes include water that has been in contact with chlorosilanes and waste hydrochloric acid. Both waste streams are pH neutralized with lime in separate clarifiers. Low chloride process wastewater is discharged to the City of Moses Lake, Sand Dunes treatment facility (outfall 001). Neutralized high chloride wastewater and the sludge from a designated clarifier are sent to a series of five lined evaporation ponds (outfall 004). Stormwater from the site is routed to a separate evaporative pond. Water in the process wastewater evaporation ponds (consisting of a weak calcium chloride solution) is concentrated by evaporation, and is marketed as a dust suppressant. Supply water for the facility is provided by the City of Moses Lake.

ASiMI's polysilicon rod finishing includes etching with hydrofluoric and nitric acids and rinsing with high purity water. The spent acids are neutralized with calcium hydroxide (lime). The sludge from this neutralization is trucked offsite for disposal. The neutralized wastewater is sent to the low chloride wastewater collection system, with an ultimate discharge to the City of Moses Lake sewer system.

Non contact cooling tower blowdown from the facility is routed through a 500,000 gallon, lined pond, prior to discharge to an irrigation return drain (outfall 003). This drain, designated as DE 226, is part of the East Low canal system of the Bureau of Reclamation's (USBR) Columbia Basin Project. The pond also serves as a source water for fire suppression. Sanitary wastes are discharged to the City of Moses Lake sewer system (outfall 002).

DISCHARGE OUTFALL

Cooling tower blowdown discharges to drain DE 226 through a underground pipe. Wastewater enters the drain through the side of the channel (e.g. there is no diffuser).

The following table summarizes the discharge outfalls and wastewater sources:

Outfall #	Wastewater Source	Discharge Location
001	low chloride process wastewater	City of Moses Lake POTW
003	cooling tower blowdown	drain DE 226
004	high chloride process wastewater, stormwater runoff	lined evaporation ponds

PERMIT STATUS

The previous permit for this facility was issued on August 7, 1997 and expired on June 30, 2001. The permit terms and conditions have been administratively extended since the expiration date. Table 1 lists the effluent limitations contained in the extended permit.

An NPDES application for permit renewal was submitted to the Department on November 30, 2000. A State application for permit renewal (for the discharge to the Moses Lake POTW) was submitted to the Department on May 16, 2001. These applications were accepted by the Department on May 17, 2001.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility last received an inspection on June 20, 2002. During the history of the previous permit, the Permittee has generally remained in compliance based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department.

The Permit limit for residual chlorine (daily maximum of 18.2 µg/L, monthly average of 7.2 µg/L) is below both the test method quantification (50 to 60 µg/L) and detection levels (10 to 12 µg/L). In 2000, the Permittee began detecting residual chlorine above the test quantification levels, up to a maximum of 218 µg/L. The source of the residual chlorine was traced to the source water supplied by the City of Moses Lake. In response to these permit exceedences, the Permittee installed an sulfur dioxide injection system at the inlet to the fire water pond in order to dechlorinate the cooling water blowdown. Since that time, residual chlorine in the discharge has been below the test method quantification levels. However, residual chlorine is periodically detected above the test method detection levels. In these cases, the samples may be in compliance, and are usually not enforced (Ecology, 1994).

The permit limit for oil and grease is no detectable amount. The previous permit specified a 1 mg/L quantification level (QL) for oil and grease using the partition-gravimetric method and method number 413.1 from 40 CFR Part 136 (Standard Method 5520 B). At the time of permit

issuance in 1997, the oil and grease test was performed using freon as an extraction solvent. During the course of the permit, hexane replaced freon as the extraction solvent, as part of a worldwide effort to eliminate the manufacture and use of chlorofluorocarbons (CFCs). CFCs deplete atmospheric ozone levels.

Using hexane resulted in a higher quantification level (1.4 mg/L). The oil and grease test is further limited by interferences such as other organic substances, and other solvent soluble substances (Standard Methods, 1999). Oil and grease using this method has been periodically detected in the Permittee's discharge.

With direction from the Department, the Permittee began using silica gel adsorption (Standard Method 5520 F) to determine the amount of hydrocarbon based oil and grease. Hydrocarbon oil and grease has not been routinely detected, albeit, at a higher detection level of 5 mg/L. Recently, the Permittee has located an out-of-State laboratory that is capable of obtaining 1 mg/L detection levels in both the oil & grease and silica gel treated oil & grease tests.

There also has been two permit exceedences for pH at outfall 001 (City POTW), occurring in the month of February, 2003. This was due to a single maintenance related incident with the pH monitoring/adjustment system.

WASTEWATER CHARACTERIZATION

From discharge monitoring reports from January, 2001 through July, 2004, the wastewater discharge is characterized for the following regulated parameters:

Parameter	Outfall 001 (POTW)		Outfall 003 (Drain DE-226)	
	Max	Avg	Max	Avg
Flow, gpd	130,500	74,900	652,800	262,400
pH, s.u.	2.4 to 11.3		7.0-9.7	
Oil&Grease, mg/L	103.0	10.2	9.2	0.6
BOD ₅ , mg/L	402	44	-	-
TDS, lbs/day	3,777	1,514	-	-
TDS, mg/L	-	-	1,320	438
Arsenic, µg/L	-	-	11.7	3.3
Chloride, lbs/day	45	15.5	-	-
Chlorine Residual, µg/L	-	-	214	5.8
Sodium, lbs/day	564	190	-	-
Fluoride, lbs/day	39.3	15.7	-	-

Additional, outfall 003 is routinely monitored for copper, lead, and volatile and semi-volatile priority pollutants. This data, along with the 2000 permit application data for outfall 003, is summarized below:

ROUTINE MONITORING (Jan 2001 to July 2004)				
Parameter	Min	Max ¹	Mean ²	#Samples
Arsenic, (µg/L)	ND	12.2	3.3	43
Copper, (µg/L)	ND	9.3	5.0	43
Lead, (µg/L)	ND	3.7	0.7	43
Volatile & Semi-Volatile Priority Pollutants	none detected			3
2000 PERMIT APPLICATION DATA				
Parameter	Min	Max	Mean	#Samples
Copper, total (µg/L)	-	9	-	1
Zinc, total (µg/L)	-	13	-	1
Volatile, Semi-Volatile & Pesticides/PCBs	none detected			1
¹ Maximum of Total Recoverable Results				
² Mean of Total Results				

Table 2 lists a complete discharge monitoring report summary for outfalls 001 and 003.

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as

present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

The Environmental Protection Agency (EPA) has not promulgated effluent guidelines for this industry (high purity polysilicon manufacture). Outfall 003 consists entirely of cooling tower blowdown. Based on best professional judgment, the Department considered guidelines applicable for cooling tower blowdown found in Subchapter N of the Code of Federal Regulations "Effluent Guidelines and Standards", revised January 4, 1993, Part 423-Steam Electric Power Generating Point Source Category.

New source performance standards (NSPS) found in 40 CFR part 423.15 (j)(1) were considered. Pollutant limits are expressed for pH, free available chlorine, priority pollutants, chromium, and zinc as follows:

Pollutant	NSPS effluent limitations (40 CFR 423.15)	
	Maximum for any one day (mg/L)	Average for 30 consecutive days (mg/L)
Free available chlorine	0.5	0.2
Chromium, total	0.2	0.2
Zinc, total	1.0	1.0
The 126 priority pollutants contained in chemicals added for cooling tower maintenance	no detectable amount	no detectable amount
pH	within the range 6.0 to 9.0	

In addition, there are standards applicable to wastewater discharged to the Columbia Basin irrigation area, codified in Chapter 372-36 WAC. The following requirements are found in WAC 372-36-040, Industrial Wastes--General requirements:

- (1) No oils, tars, cleaning compounds or inflammables.
- (2) No phenols or pheno-like compounds in excess of 0.05 parts per million.
- (3) No toxic materials such as: (a) fruit washing compounds; (b) wood preservatives; (c) Insecticides- aldrin, rotenone, BHC, DDT, and all other similar products; (d) No weed killers; (e) Metallic or nonmetallic products of metal processing or plating-acids, alkalies, cyanides, copper, etc.
- (4) Total salts, maximum 2,500 parts per million.
- (5) No salts or elements injurious to crops, soils or animals-aluminum, boron, arsenic, selenium, lead, manganese, etc.

(6) No wastes with a pH less than 6.5 or greater than 8.5.

(7) No floating solids.

(8) No suspended solids in excess of that which can be removed by approved clarification or settling with a 2 hour detention period.

Based on these standards and best professional judgment, the following would be proposed technology based limitations for discharge to the irrigation return drain:

Parameter	Maximum for any one day (mg/L)	Average for 30 consecutive days (mg/L)
Free available chlorine	0.5	0.2
Chromium, total	0.2	0.2
Zinc, total	1.0	1.0
The 126 priority pollutants contained in chemicals added for cooling tower maintenance	no detectable amount	no detectable amount
pH	within the range 6.5 to 8.5	
Hydrocarbon Oil and Grease	no detectable amount	
Total Dissolved Solids	2,500	-

In addition to Chapter 372-36, the Department of Interior, Bureau of Reclamation has developed policy for wastewater discharges to the Upper Columbia irrigation area's drainage infrastructure. The following summarizes items of this policy relating to specific discharge requirements or standards:

- A proposed wastewater discharge may be accepted for consideration only when the proponent can substantiate that other environmentally or economically viable alternatives are not available and the proposed discharge meets all requirements of Reclamation and the operating entity(ies)
- Reclamation's formal authorization will be provided in the form of a standard outgrant.
- Review and approval by the operating entity(ies) is a prerequisite of Reclamation approval.
- Reclamation may cancel the discharge outgrant if conditions placed on the outgrant are not met by the proponent. All discharge into Reclamation facilities will be halted immediately upon receipt of notice from Reclamation or the operating entity(ies). Facilities sufficient to ensure the retention of all discharges by the proponent will be demonstrated prior to the issuance of a outgrant.
- Reclamation and the operating entity(ies) shall determine available system capacity for both the receiving facility and downstream tributaries. If it is determined that there is insufficient capacity to handle a proposed discharge, the proposal shall be denied.
- A discharge may be conditioned to specific instantaneous flows and/or times and seasonal operational variances.
- Discharges shall meet or exceed the wastewater quality parameters delineated in the proponent's NPDES and/or State Waste Discharge permit; but in no event shall they be of less quality than the

source from which the receiving irrigation water supply is derived, as determined by Reclamation. Discharges shall meet or exceed sediment quality based standards and procedures.

- Wastewater quality based standards shall be assigned to the discharge outfall (end of pipe). Discharges shall meet or exceed water quality based standards required by state and federal laws, rules or regulations. Under no circumstances shall wastewater quality based standards be achieved through mixing zones (dilution). Water temperature degradation shall not be allowed and the water temperature will exceed threshold temperatures specified in the outgrant. The threshold temperatures are the sole and exclusive discretion of Reclamation and will be temperatures that do not affect the suitability of the water supply for irrigation and do not warm the canal or drain enough to cause increased aquatic weed growth or aquatic pest proliferation.
- In addition to monitoring requirements stipulated in outgrants issued by state or local jurisdictions, the proponent may be required periodically to independently test and provide results to Reclamation and the operating entity(ies) to assure full compliance with stipulated base wastewater quality standards.

In consideration of this policy, the Department has not assigned any mixing zone for meeting toxic water quality criteria (see Consideration of Surface Water Quality Based Limits for Numeric Criteria, pg 16). The proposed permit does not contain other requirements of the Bureau's policy.

EFFLUENT LIMITATIONS (discharge to POTW)

State regulations require that limitations for the discharge to the POTW must be based on the technology available to treat the pollutants (technology-based) or be based on the effects of the pollutants to the POTW (local limits). Wastewater must be treated using all known, available, and reasonable treatment (AKART) and not interfere with the operation of the POTW.

The more stringent of the local limits-based or technology-based limits are applied to each of the parameters of concern. Each of these types of limits is described in more detail below.

Technology-Based Limitations

All waste discharge permits issued by the Department must specify conditions requiring available and reasonable methods of prevention, control, and treatment of discharges to waters of the state (WAC 173-216-110). There are no federal categorical limitations listed under 40 CFR for production of high purity polysilicon.

The discharge to the POTW (low chloride wastewater) currently consists of ion exchange backwash, rinsing of the reactors, and miscellaneous process area floor drains and wash areas. Prior to discharge, the wastewater is neutralized with lime. Design criteria contained in a 1985 engineering report (RUST, 1985) contained the following effluent characteristics:

Parameter	Outfall 001 (POTW)	
	Max	Avg
Flow, gpd	103,680	86,400
pH, s.u.	6.0-9.0	
Oil&Grease, mg/L	100	-

TDS, lbs/day	5,600	4,668
Chloride, lbs/day	396	330
Sodium, lbs/day	328	273
Fluoride, lbs/day	23	19

In the permit issued in 1990, certain limitations were increased to accommodate an increase in production at the facility: the daily maximum TDS limit was increased to 8,400 lbs/day; the daily maximum sodium was increased 492 lbs/day; daily maximum and monthly average fluoride levels were increased to 46 and 28 lbs/day, respectively; and maximum and average flow was increased to 132,000 and 110,000 gallons/day, respectively. In the 1997 permit, the daily maximum and monthly average sodium levels were increased to 552 and 333 lbs/day, respectively. This increase was an allowance for a change in City water supply to the facility, which contained a higher level of sodium.

Effluent Limitations Based on Local Limits

In order to protect the Sand Dunes treatment plant from pass-through, interference, concentrations of toxic chemicals that would impair beneficial or designated uses of sludge, or potentially hazardous exposure levels, limitations for certain parameters are necessary. These limitations are based on both local limits established by the City of Moses Lake (codified in ordinance) and Ecology. Applicable limits for this discharge set by the City of Moses Lake include BOD₅ (limit of 300 mg/L), pH (within the range 6.0 to 11.0), oil and grease (limit of 100 mg/L), and TSS (limit of 350 mg/L).

The Sand Dunes treatment plant discharges its treated municipal wastewater to groundwater via rapid infiltration. The current wastewater disposal methods at the Sand Dunes plant have a significant potential to degrade ground water quality. Total dissolved solids (TDS) contained in the wastewater are not removed through the treatment process. These dissolved solids may pass through, and impact downgradient ground water quality.

The previous permit required an engineering report that evaluated alternatives for reducing the amount of TDS discharged to the City POTW. The study (CH2M Hill, 1998) identified that about 60 percent of the TDS load from the facility originates from supply water treatment (ion exchange regenerations). The major ions contributing to effluent TDS were identified as sulfate, sodium, and calcium.

Alternatives to reduce TDS included changing water supply treatment (reverse osmosis), using an alternate water supply (surface water irrigation supply), using an offsite location to regenerate ion exchange resins; and discharging to a land application system. All these alternative were discounted because of technical or cost issues. Therefore, the focus was placed on optimizing the existing ion exchange system to reduce TDS loadings.

Table 3 lists TDS data from the Sand Dunes treatment plant effluent. Since 2001, effluent TDS averaged 9,805 lbs/day (594 mg/L). During the same time period, TDS discharged from the permittee averages about 1,514 lbs/day, or about 15 percent of the loading to the treatment plant.

Because of the Permittee's continued contribution of TDS to the POTW, the proposed permit will require an updated engineering report evaluating options to prevent, control, and/or treat to reduce effluent TDS. This report will be due eighteen months from the permit issuance date.

The previous permit limited the discharge from outfall 001 based on the 1995 engineering report, the 1990 increase in production, and the 1997 permit limit increase. These limits are compared to discharge data (since 2001) below:

Parameter	Permit Limitations		Outfall Discharge Summary	
	Max	Avg	Max	Avg
TDS, lbs/day	8,400	4,668	3,777	1,514
Chloride, lbs/day	396	330	45	15.5
Sodium, lbs/day	552	333	564	190
Fluoride, lbs/day	46	28	39.3	15.7

TDS and chlorides are far below the current permitted levels, while sodium and fluoride are within the range of permitted limits. Because of the TDS concern, the proposed permit will set more stringent limits for both TDS and chlorides.

The revised limits were determined by examining the discharge data from January, 2001 to June, 2004. The highest monthly loading for TDS occurred in March, 2001 (monthly average and daily maximum values of 2,240 and 3,776 lbs/day, respectively). The highest daily chloride loading occurred in February, 2002 (daily maximum of 45 lbs/day) while the highest monthly average occurred in April, 2001 (monthly average of 24.9 lbs/day). Proposed limits were set by increasing these values by 5%, as follows:

Parameter	Monthly Highest Loadings		Proposed Limitations	
	Max	Avg	Max	Avg
TDS, lbs/day	3,776	2,240	3,965	2,352
Chloride, lbs/day	45	24.9	47.3	26.2

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin wide total maximum daily loading study (TMDL).

On July 1, 2003, the State adopted amended Surface Water Quality Standards. However, these amended standards have not yet been approved by the Environmental Protection Agency (EPA) and hence cannot be used for any Federal related permit decisions. Therefore, the 1997 version of the Surface Water Quality Standards were used in this proposed permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

ANTIDegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility will discharge to a wasteway lateral of the East Low canal system of the Bureau of Reclamation's (USBR) Columbia Basin Project (see Figure 1). The irrigation return drain (designated DE-226) is a tributary that feeds into the Rocky Coulee drain. The Rocky Coulee drain eventually flows into Potholes Reservoir, roughly 9 miles downstream. The Potholes reservoir would be designated as a Lake Class receiving water. By virtue of being a tributary to a lake class water, the current Water Quality Standards (Chapter 173-201A-120), would classify the irrigation return drain as class AA, extraordinary waters.

The water quality of the drain would be typical of any irrigation return flow, affected mainly by agricultural practices. Pollutants expected to be present may include sediments, nutrients, and residual pesticides/herbicides.

Characteristic uses of Class AA waters include the following water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation. Water quality of this class shall markedly and uniformly exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	50 organisms/100 mL maximum geometric mean
Dissolved Oxygen	9.5 mg/L minimum
Temperature	16 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTU above background

Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)
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The previous permit required the Permittee to collect and analyze surface water samples from drain DE-226, both upstream and downstream from the discharge outfall. The testing included pH, dissolved oxygen (DO) and temperature (Appendix C).

From this testing, ambient water quality, upstream of the discharge, appears to periodically exceed pH (exceeds the maximum of 8.5 s.u.), temperature (exceeds the maximum of 16°C), and dissolved oxygen (below the minimum of 9.5 mg/L) criteria given in Chapter 173-201A WAC (1997 version) for class AA waters.

Potholes Reservoir is on the Department's 1998 303(d) list for dieldrin. The 303(d) list is published by the Department every two years and specifies waterbodies where parameters exceed surface water quality criteria. The proposed discharge will not contain any dieldrin, and not contribute any levels to Potholes Reservoir.

A segment of the Rocky Coulee Drain at Highway 17, approximately 3.5 miles downstream from the Permittee's discharge, is on the Department's candidate 2002/2004 303(d) list for pH (category 5). Category 5 are waters that require a TMDL. Placement in this category means that the Department has data showing that the water quality standards have been violated, and that there is no TMDL or pollution control plan.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Some parameters in the discharge (temperature, dissolved oxygen, and pH) may exceed water quality criteria at the point of discharge. Therefore, a mixing zone is authorized only for pH, temperature, and dissolved oxygen in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in chapter 173-201A WAC and are defined as follows:

- (i) not extend in a downstream direction from the discharge point greater than 300 feet;
- (ii) not utilize greater than 25 percent of the flow; and not occupy greater than 25 percent of the width of the waterbody.

As discussed above, the Permittee has been required to monitor the receiving water upstream and downstream (at the mixing zone boundary) of the discharge. Results indicate that there is little difference between the upstream and downstream stations (Appendix C).

However, the results do show that the receiving water fails to meet applicable surface water quality criteria for these parameters, upstream of the discharge. Further, increases in downstream receiving water pH are sometimes above incremental increases allowed for class AA waters (variation of less than 0.2 s.u.).

Considering that the newly adopted Water Quality Standards (which are not yet approved by the EPA and hence cannot be used in any permit decisions) will change the classification of this receiving water body, the proposed permit continues to require the Permittee to monitor the

receiving water for these parameters. When the new standards are approved by EPA, this data will be used for future permit decisions.

The Department believes the authorization of this mixing zone for these parameters will not cause a loss of sensitive or important habitat, interfere with existing or characteristic uses of the water body (including uses as irrigation supply water), result in damage to the ecosystem or adversely affect public health.

pH--Because of the high pH of the supply water, the pH of the Permittee's discharge is also high (typically above 9.0). The previous permit set an allowable pH range of 6.5 to 9.5. This is above discharge standards found in both 40 CFR part 423.15 (within the range 6.0 to 9.0) and the Columbia Basin Irrigation discharge standards (within the range 6.5 to 8.5).

The Department considered that treatment to reduce the pH would only contribute more dissolved solids to the effluent. The dissolved constituents may interfere with downstream water uses as irrigation supply water. Therefore, based on best professional judgment, the proposed permit limitation for pH will be remain within the range 6.5 to 9.5.

For all other parameters in the discharge, no mixing zone will be authorized (water quality criteria will be met at end of pipe). This decision is based on the following considerations: the Bureau of Reclamation policy stating that under no circumstances shall wastewater quality based standards be achieved through mixing zones (dilution); and based on best professional judgment that non contact cooling tower blowdown should not contain any chemicals at levels above surface water quality standards.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: copper, arsenic, lead, and zinc (based on routine monitoring and permit application data (see WASTEWATER CHARACTERIZATION Section on page 3)). These metals are likely present in trace amounts in the water supply to the facility (provided by the City of Moses Lake). A reasonable potential analysis (See Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for copper, arsenic, lead, and zinc to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition, assuming no mixing zone (i.e. water quality criteria are applicable at end-of-pipe). The parameters used in the critical condition modeling are as follows: a receiving water hardness of 100 mg/L as mg CaCO₃/L. This hardness represented an estimation of the 10th percentile lowest receiving water hardness, as measured by the Permittee under requirements of the previous permit.

Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards for copper, arsenic,

lead, and zinc. This determination assumes that the Permittee meets the other effluent limits of this permit.

The technology based limitations for residual chlorine would not meet surface water quality criteria (given no mixing zone). Residual chlorine is present in the discharge from the City water supply (City water is chlorinated). Therefore, an effluent limit was derived for chlorine using methods from EPA, 1991 as shown in Appendix C. The resultant effluent limit for chlorine is a daily maximum and daily average of 18.2 and 7.2 µg/L, respectively.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center 360-407-7472 for a copy. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

An effluent characterization for acute and chronic toxicity was conducted during the previous permit term. In accordance with WAC 173-205-060, the Permittee must repeat this effluent characterization for the following reason:

The Permittee has made changes to processes, materials, or treatment that could result in an increase in effluent toxicity. In accordance with WAC 173-205-060(1), the proposed permit requires another effluent characterization for toxicity.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the effluent is likely to have chemicals of concern for human health (arsenic). A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July, 1994).

The determination indicated that the discharger has a reasonable potential to cause a violation of water quality standards for arsenic. However, the Department will not include a human health based arsenic limit in the proposed permit because of the uncertainty of the freshwater human health criteria for arsenic.

In 1992, the USEPA adopted risk-based arsenic criteria for the protection of human health for the State of Washington. The freshwater criterion is 0.018 µg/L, and is based on exposure from fish and shellfish tissue and water ingestion. This criterion is controversial because it differs from the drinking water maximum contaminant level (MCL) of 10 µg/L. Further, the human health criteria are sometimes exceeded by natural background concentrations of arsenic in surface water and ground water.

The proposed permit still retains an arsenic daily maximum limit of 50 µg/L, based on the limitation from the previous permit.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED AUGUST 4, 1997

The following tables compare proposed permit limits with the previous permit limits. For outfall 001, the proposed permit includes more restrictive permit limits for TDS and chloride.

Parameter	Outfall 001 (POTW)			
	Existing Limits		Proposed Limits	
	Avg	Max	Avg	Max
Flow, gpd	110,000	132,000	110,000	132,000
pH, s.u.	Within the range 6.0 - 11.0		Within the range 6.0 - 11.0	
Oil&Grease, mg/L	-	100	-	100
BOD ₅ , mg/L	-	300	-	300
TSS, mg/L	-	-	350	-
TDS, lbs/day	4,668	8,400	2,352	3,965
Chloride, lbs/day	330	396	26.2	47.3
Sodium, lbs/day	333	552	333	552
Fluoride, lbs/day	28	46	28	46

For outfall 003, the oil & grease no detectable amount will be determined using silica gel treated, hexane extractable material (EPA Method 1664, revision A), with a quantification level specified at 1 mg/L.

Parameter	Outfall 003 (Drain DE-226)			
	Existing Limits		Proposed Limits	
	Avg	Max	Avg	Max
TDS, mg/L	-	2,500	-	2,500
Total Residual Chlorine, µg/L	7.2	18.2	7.2	18.2
Arsenic, µg/L	-	50	-	50
pH, s.u.	Within the range 6.5 - 9.5		Within the range 6.5 - 9.5	
Oil&Grease, mg/L	No detectable amount		No detectable amount	
The 126 priority pollutants	None added for cooling tower maintenance		None added for cooling tower maintenance	

For outfall 004, proposed permit limits are the same as in the previous permit (no discharge to either surface or ground waters of the State).

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring for sulfate has been added to the monitoring parameters for outfall 001. Sulfate is present in the discharge from the ion exchange backwash. This pollutant contributes to the overall TDS loading to the City POTW.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

Because annual priority pollutant monitoring has not detected any priority pollutants, this testing has been qualified in the proposed permit. As allowed by 40 CFR Part 423(j)(3), compliance with this may instead be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

Monitoring for copper and lead has been discontinued in the proposed permit due to the lack of reasonable potential to exceed applicable receiving water quality criteria.

EFFLUENT LIMITS BELOW QUANTITATION

The water quality-based effluent limits for the daily maximum residual chlorine (18.2 µg/L) in the wastewater is below the capability of current analytical technology to quantify. The Quantification Level is the level at which concentrations can be reliably reported with a specified level of error. For maximum daily effluent limits, if the measured effluent concentration is below the Quantification Level, the Permittee reports NQ for non-quantifiable. For average monthly effluent limits, all effluent concentrations below the Quantification Level but above the Method Detection Level are used as reported for calculating the average monthly value.

EFFLUENT LIMITS BELOW DETECTION

The water quality-based effluent limits for monthly average residual chlorine (7.2 µg/L) in the wastewater is below the capability of current analytical technology to detect. The Method Detection Level (MDL) is the minimum concentration of an analyte that can be measured and reported with a 99 percent confidence that it's concentration is greater than zero as determined by a specific laboratory method. For maximum daily limits, if the concentrations are below the MDL the Permittee reports ND for non-detectable. For average monthly limits, all values above the MDL are used as reported and all values below the MDL are calculated as zero.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited for: chloride, total chlorine residual, fluoride, pH, TDS, TSS, conductivity, calcium and sodium.

OTHER PERMIT CONDITIONS***REPORTING AND RECORDKEEPING***

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

NON-ROUTINE AND UNANTICIPATED DISCHARGES

Occasionally, this facility may generate wastewater which is not characterized in their permit application because it is not a routine discharge and was not anticipated at the time of application. These typically are waters used to pressure test storage tanks or fire water systems or leaks from drinking water systems. These are typically clean waste waters but may be contaminated with pollutants. The permit contains an authorization for non-routine and unanticipated discharges. The permit requires a characterization of these waste waters for pollutants and examination of the opportunities for reuse. Depending on the nature and extent of pollutants in this wastewater and opportunities for reuse, Ecology may authorize a direct discharge via the process wastewater outfall or through a stormwater outfall for clean water, require the wastewater to be placed through the facilities wastewater treatment process or require the water to be reused.

SPILL PLAN

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee has developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the Permittee to update this plan and submit it to the Department.

SOLID WASTE PLAN

The Department has determined that the Permittee has a potential to cause pollution of the waters of the state from leachate of solid waste.

This proposed permit requires, under the authority of RCW 90.48.080, that the Permittee update the solid waste plan designed to prevent solid waste from causing pollution of the waters of the state. The plan must be submitted to the local permitting agency for approval, if necessary, and to the Department.

TREATMENT SYSTEM OPERATING PLAN

In accordance with state and federal regulations, the Permittee is required to take all reasonable steps to properly operate and maintain the treatment system (40 CFR 122.41(e)) and WAC 173-220-150 (1)(g). An operation and maintenance manual was submitted as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). It has been determined that the implementation of the procedures in the Treatment System Operating Plan is a reasonable measure to ensure compliance with the terms and limitations in the permit.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual industrial NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES*PERMIT MODIFICATIONS*

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

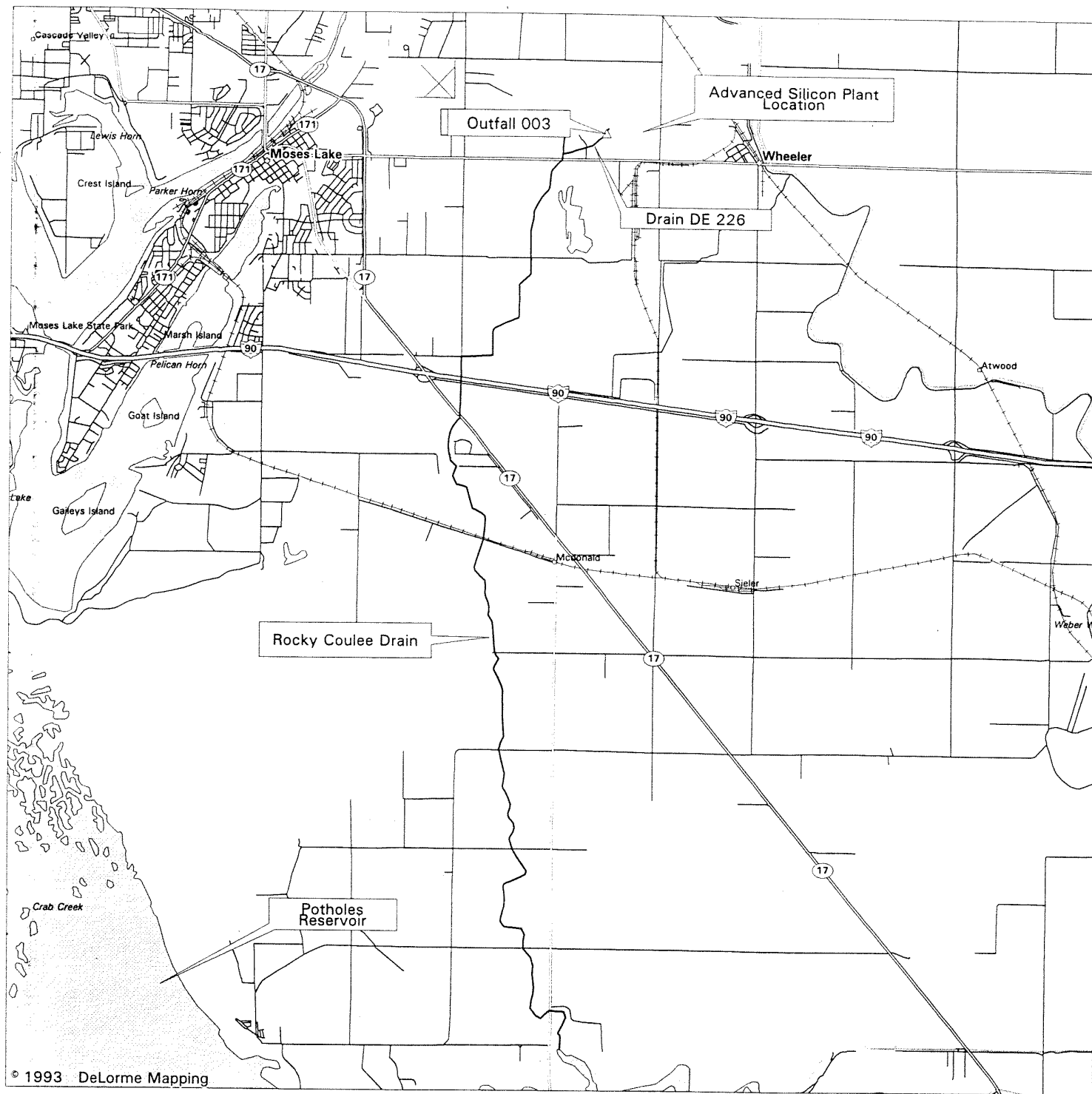
The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this proposed permit be issued for 5 years.

REFERENCES FOR TEXT AND APPENDICES

- CH2M Hill, 1998. Advanced Silicon Materials, Inc., AKART Analysis Final Report, CH2M Hill, April, 1998.
- EPA, 1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
- EPA, 1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
- EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.
- EPA, 1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
- EPA, 1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.
- Ecology, 1994. Permit Writer's Manual, Washington State Department of Ecology, Publication Number 92-109.
- RUST, 1985. Engineering Report on Effluent Streams and Solid Wastes from Polysilicon Plant Expansion, Union Carbide Corporation, Moses Lake, Washington, Prepared by RUST, April, 1985.



LEGEND

	Population Center		Interstate Highway
	State Route		Railroad
	Geo Feature		RR Underpassing
	Interstate, Turnpike		River
	Street, Road		Land Mass
	Hwy Ramps		Open Water
	Major Street/Road		Intermittent River
	State Route		Utility (powerline)

Scale 1:87,500 (at center)

2 Miles

2 KM

Mag 13.00

Thu May 01 16:39:20 1997

**Figure 1 - Site
Location - Solar
Grade Silicon**

Table 1 - Existing Permit Limitations, Solar Grade Silicon, LLC

Parameter	Outfall 001 (POTW)		Outfall 003 (Drain DE-226)	
	Avg	Max	Avg	Max
Flow, gpd	110,000	132,000	-	-
pH, s.u.	Within the range 6.0 - 11.0		Within the range 6.5 - 9.5	
Oil&Grease, mg/L	-	100	No detectable amount	
BOD ₅ , mg/L	-	300	-	-
TDS, lbs/day	4,668	8,400	-	-
TDS, mg/L	-	-	-	2,500
Arsenic, mg/L	-	-	-	0.05
Total Residual Chlorine	-	-	7.2	18.2
Chloride, lbs/day	330	396	-	-
Sodium, lbs/day	333	552	-	-
Fluoride, lbs/day	28	46	-	-

Table 2 - Discharge Monitoring Report Summary, Outfall 001 - Solar Grade Silicon, 1/01 to 7/04

Date	Flow (gpd)		pH (s.u.)		Cond (µmhos/cm)		Temp (°F)		TSS (mg/L)	
	Avg	Max	Min	Max	Min	Max	Avg	Max	Avg	Max
Jan-01	100,861	117,107	6.2	9.4	600	6,000	49	58	155	303
Feb-01	101,355	119,414	6.4	9.4	300	9,000	47	50	287	1,259
Mar-01	100,760	121,495	6.4	9.8	600	6,900	49	62	289	604
Apr-01	99,034	130,164	6.4	10.1	300	4,800	51	58	216	833
May-01	89,269	125,479	6.3	10.2	600	6,000	56	70	228	802
Jun-01	81,866	103,006	6.4	9.7	300	4,500	56	64	173	350
Jul-01	96,553	125,477	6.3	10.9	300	3,600	58	61	319	1,497
Aug-01	95,125	121,387	6.2	9.5	300	3,000	58	61	327	1,756
Sep-01	95,177	125,192	6.2	9.4	3,000	5,400	57	60	366	660
Oct-01	92,439	121,011	6.4	10	300	900	53	58	380	1,090
Nov-01	79,194	111,848	6.3	9.4	300	7,500	49	52	349	1,218
Dec-01	70,243	105,276	6.2	9	300	3,900	46	55	259	524
Jan-02	62,581	88,777	6	9.8	600	7,500	46	58	182	665
Feb-02	49,826	74,649	6.2	9.1	300	3,600	43	50	211	542
Mar-02	17,344	77,269	6.2	9.1	300	3,000	44	54	82	157
Apr-02	66,162	106,155	6	9.8	200	4,500	50	62	181	533
May-02	74,455	129,099	6.4	9.8	300	5,400	54	62	161	381
Jun-02	55,819	98,452	6.1	9.5	300	5,700	58	69	287	2,386
Jul-02	58,260	130,546	6.3	9	300	4,200	62	78	225	536
Aug-02	56,745	89,280	6	10.8	300	5,400	60	68	194	530
Sep-02	52,110	86,579	6.3	10	300	5,400	54	62	129	230
Oct-02	57,116	108,986	6.9	10.8	300	7,800	47	58	88	244
Nov-02	57,885	90,881	6.2	10.9	300	5,700	48	54	140	392
Dec-02	91,655	128,472	6.4	10.1	300	3,600	46	50	237	568
Jan-03	92,412	110,924	6.2	9.8	300	3,000	42	62	303	960
Feb-03	84,987	119,911	5.9	9.9	300	3,000	46	60	399	2,778
Mar-03	85,365	113,335	6.4	10	250	3,000	49	60	238	928
Apr-03	87,361	114,669	6.2	10.5	43	4,764	47	60	388	3,072
May-03	81,966	110,195	6.4	10.9	1,395	6,035	52	64	135	911
Jun-03	57,122	110,288	6.5	11.3	1	5,021	60	68	152	667
Jul-03	60,290	97,173	6.1	10.2	1,407	5,229	62	74	165	448
Aug-03	25,629	92,845	6.1	9.8	75	7,292	62	74	162	601
Sep-03	72,587	129,985	2.1	11.2	0	5,991	55	62	275	726
Oct-03	70,196	100,378	6.1	10.6	155	6,865	57	70	287	816
Nov-03	59,585	92,863	5.4	10.4	308	6,984	54	66	317	900
Dec-03	63,533	106,643	6.5	9.8	355	5,166	67	84	294	838
Jan-04	74,614	108,151	6.5	10	0	4,978	66	72	336	758
Feb-04	97,090	127,314	6	10.3	0	7,100	65	70	437	978
Mar-04	86,137	114,655	6.6	10.1	370	4,031	67	72	379	993
Apr-04	93,224	122,911	6.3	10.2	356	4,200	62	70	300	676
May-04	72,257	104,059	6	10.1	28	4,712	66	78	309	1,116
Jun-04	78,813	115,427	6.5	10.7	495	2,931	70	79	305	691
Jul-04	75,031	102,212	6	10.9	69	3,777	72	83	257	899

Min	17,344	74,649	2.1	9.0	0	900	42	50	82	157
Avg	74,884	109,999	6.2	10.1	393	5,055	55	64	254	879
Max	101,355	130,546	6.9	11.3	3,000	9,000	72	84	437	3,072

**Permit
Limits:**

Min	-	-	6	-	-	-	-	-	-	-
Avg	110,000	-	-	-	-	-	-	-	-	-
Max	-	132,000	-	9	-	-	-	-	-	-

Table 2 - Discharge Monitoring Report Summary, Outfall 001 - Solar Grade Silicon, 1/01 to 7/04

Date	TDS (mg/L)		TDS (lbs/day)		BOD (mg/L)		Oil & Grease (mg/L)		Calcium (mg/L)	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
Jan-01	2,198	3,120	1,813	2,777	21	28	5.7	6.9	326	585
Feb-01	1,974	3,130	1,678	2,732	19	27	10.4	15.3	314	540
Mar-01	2,633	4,130	2,240	3,776	120	402	11.4	21.2	448	830
Apr-01	2,434	4,522	2,021	3,603	23	28	6.1	10.0	374	857
May-01	2,137	3,032	1,652	2,809	50	160	12.7	37.4	312	554
Jun-01	2,005	3,358	1,383	2,885	14	20	5.2	6.5	320	612
Jul-01	1,395	2,084	1,144	1,765	46	87	7.9	13.5	188	357
Aug-01	1,873	3,642	1,529	3,095	57	80	15.4	30.5	313	805
Sep-01	2,069	3,276	1,794	2,921	63	89	5.8	7.8	362	631
Oct-01	1,933	2,830	1,538	2,263	33	57	6.0	13.7	324	585
Nov-01	1,884	2,622	1,353	2,085	71	120	8.2	9.7	301	501
Dec-01	1,848	2,800	1,169	2,458	46	72	5.5	15.7	334	629
Jan-02	1,832	2,926	1,006	1,639	68	204	11.9	39.1	305	614
Feb-02	1,713	2,810	766	1,620	32	44	2.5	3.8	261	494
Mar-02	1,469	2,404	620	1,313	17	25	4.7	7.0	237	359
Apr-02	1,891	3,338	1,102	2,275	17	23	5.8	7.4	328	560
May-02	2,448	4,564	1,556	3,240	15	41	1.3	2.9	457	834
Jun-02	2,894	4,168	1,453	2,400	22	52	0.8	1.7	553	961
Jul-02	2,551	3,986	1,341	3,739	20	32	0.0	0.0	411	752
Aug-02	2,595	4,062	1,318	2,565	10	13	5.6	17.4	476	869
Sep-02	944	2,681	1,394	2,632	11	20	2.4	7.2	515	866
Oct-02	2,524	4,536	1,371	2,529	19	35	2.5	7.0	440	789
Nov-02	2,144	3,378	1,146	2,020	20	24	4.5	14.0	267	555
Dec-02	2,187	3,354	1,788	2,968	40	67	10.4	14.9	290	571
Jan-03	1,793	2,586	1,405	2,373	50	117	17.7	55.2	252	490
Feb-03	2,006	3,048	1,537	2,559	45	68	6.1	9.3	252	547
Mar-03	2,059	2,918	1,475	2,476	49	76	13.8	27.4	237	420
Apr-03	2,460	3,168	1,881	2,825	71	83	37.3	103.0	286	514
May-03	2,225	4,506	1,555	2,957	36	59	10.4	21.5	220	389
Jun-03	2,550	3,970	1,350	2,465	43	49	11.5	26.7	279	609
Jul-03	2,622	4,170	1,387	2,673	54	136	15.3	28.6	293	640
Aug-03	2,710	3,698	1,775	2,676	88	111	14.5	16.4	305	536
Sep-03	2,717	4,402	1,701	3,512	59	89	11.1	16.5	314	861
Oct-03	2,955	4,222	1,804	2,508	88	126	15.4	38.8	329	771
Nov-03	2,202	3,288	1,172	2,342	66	120	20.9	45.8	194	417
Dec-03	2,836	5,524	1,637	3,347	65	76	19.7	26.9	339	985
Jan-04	2,689	3,464	1,707	2,828	48	68	14.5	28.3	352	540
Feb-04	2,427	3,656	2,078	3,255	83	109	25.4	49.4	259	652
Mar-04	2,355	2,970	1,733	2,413	43	58	7.5	12.4	176	331
Apr-04	2,353	4,108	1,957	3,777	75	96	19.7	39.0	262	675
May-04	2,547	3,356	1,656	2,807	28	55	7.9	18.6	251	433
Jun-04	2,331	3,592	1,672	2,859	22	36	7.0	21.2	263	663
Jul-04	2,226	3,390	1,426	2,094	21	32	8.4	23.4	207	416
Min	944	2,084	620	1,313	10	13	0.0	0.0	176	331
Avg	2,224	3,507	1,514	2,671	44	77	10.2	21.4	315	618
Max	2,955	5,524	2,240	3,777	120	402	37.3	103.0	553	985

**Permit
Limits:**

Min	-	-	-	-	-	-	-	-	-	-
Avg	-	-	4,668	-	-	-	-	-	-	-
Max	-	-	-	8,400	-	300	-	100	-	-

Table 2 - Discharge Monitoring Report Summary, Outfall 001 - Solar Grade Silicon, 1/01 to 7/04

Date	Chloride (mg/L)		Chloride (lbs/day)		Flouride (mg/L)		Flouride (lbs/day)		Nitrate (mg/L)	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
Jan-01	26.8	35.0	21.9	29.2	6.1	16.0	5.1	14.2	142	197
Feb-01	26.6	39.5	22.4	32.4	5.5	15.3	4.8	14.4	63	149
Mar-01	22.5	41.7	19.1	41.1	5.7	9.2	4.9	8.5	26	84
Apr-01	30.0	37.7	24.9	32.2	7.6	12.6	6.4	11.7	138	236
May-01	31.3	45.0	23.7	32.5	5.6	8.7	4.3	8.3	68	116
Jun-01	26.8	36.0	18.2	30.5	5.8	8.9	4.0	6.9	195	239
Jul-01	27.1	43.2	22.3	36.7	3.9	6.1	3.3	5.9	26	41
Aug-01	28.9	47.5	23.3	40.3	5.4	14.0	4.4	12.3	122	182
Sep-01	26.3	35.5	22.4	33.1	12.0	22.9	10.6	23.9	145	347
Oct-01	24.4	37.2	19.2	28.2	9.7	25.4	7.9	22.3	124	254
Nov-01	25.8	43.7	17.9	26.2	16.8	45.5	12.6	39.3	149	246
Dec-01	28.6	45.7	17.8	30.9	8.4	16.7	5.4	13.9	103	225
Jan-02	25.4	60.0	13.8	24.7	9.0	16.0	5.0	10.9	115	268
Feb-02	33.3	112.5	14.3	45.0	8.8	15.0	3.8	6.7	92	206
Mar-02	20.5	35.2	8.3	15.3	9.0	18.0	3.8	8.2	119	164
Apr-02	21.8	42.4	12.0	22.3	11.1	22.0	6.1	14.4	178	236
May-02	22.5	44.2	14.6	31.4	12.3	35.9	7.8	16.2	235	371
Jun-02	27.6	43.0	14.0	30.2	15.0	28.0	7.9	18.9	335	448
Jul-02	23.7	38.5	12.4	28.4	18.3	34.0	10.2	31.4	368	728
Aug-02	24.0	54.5	11.6	24.2	17.7	30.0	9.5	18.8	366	457
Sep-02	25.1	40.0	12.5	23.2	19.2	30.0	10.0	19.2	261	513
Oct-02	27.0	41.0	14.5	28.9	15.8	25.0	8.6	16.5	314	514
Nov-02	25.2	36.0	13.2	24.5	13.0	20.0	7.0	14.5	237	401
Dec-02	20.1	28.0	16.1	26.8	9.1	17.0	7.8	17.1	131	210
Jan-03	14.3	24.0	10.9	14.8	7.5	16.5	6.0	14.7	149	240
Feb-03	22.0	52.0	15.4	22.7	11.6	18.0	8.8	18.0	147	229
Mar-03	14.3	29.0	10.1	24.2	7.2	13.0	5.1	11.6	79	151
Apr-03	13.7	26.5	10.2	20.1	7.3	15.0	5.6	14.3	177	265
May-03	18.4	37.0	12.4	20.2	9.6	19.6	6.7	13.1	92	127
Jun-03	22.2	47.5	12.0	30.9	12.2	21.0	6.7	13.6	239	319
Jul-03	23.6	33.0	12.3	20.0	12.1	21.3	6.6	13.5	154	279
Aug-03	21.0	35.0	13.5	27.1	14.7	26.5	9.8	20.5	100	230
Sep-03	20.5	29.5	12.1	23.0	12.6	25.0	8.4	23.8	183	235
Oct-03	23.9	39.0	14.4	23.4	14.1	20.0	8.7	15.1	142	220
Nov-03	21.3	28.5	10.9	17.0	11.6	23.0	6.3	12.5	129	193
Dec-03	18.8	30.0	10.5	19.2	14.3	24.0	8.7	16.7	76	133
Jan-04	20.4	30.0	13.1	25.9	12.4	20.0	7.9	18.0	137	208
Feb-04	19.5	50.5	15.8	30.8	9.3	17.1	9.3	17.1	131	162
Mar-04	22.0	33.6	16.0	24.8	8.0	14.6	6.3	13.5	100	151
Apr-04	19.7	38.7	15.2	25.0	10.1	18.0	8.3	15.4	112	214
May-04	26.7	40.0	16.5	27.0	11.4	21.1	7.5	14.3	183	259
Jun-04	26.7	41.0	18.7	28.7	13.7	22.1	10.5	20.5	139	217
Jul-04	27.1	45.0	17.1	26.1	13.4	21.6	8.8	13.4	76	108
Min	13.7	24.0	8.3	14.8	3.9	6.1	3.3	5.9	26	41
Avg	23.7	40.8	15.5	27.2	10.8	20.2	7.1	15.7	153	251
Max	33.3	112.5	24.9	45.0	19.2	45.5	12.6	39.3	368	728

**Permit
Limits:**

Min	-	-	-	-	-	-	-	-	-	-
Avg	330	-	-	-	-	-	28	-	-	-
Max	-	396	-	-	-	-	-	46	-	-

Table 2 - Discharge Monitoring Report Summary, Outfall 001 - Solar Grade Silicon, 1/01 to 7/04

Date	Sodium (mg/L)		Sodium (lbs/day)		Arsenic (µg/L)	Copper (µg/L)	Lead (µg/L)
	Avg	Max	Avg	Max			
Jan-01	285	594	232	529	4.7	16.7	1.0
Feb-01	257	485	217	398	5.2	65.3	0.0
Mar-01	315	464	266	419	9.2	85.3	0.0
Apr-01	308	468	260	447	4.2	38.9	3.1
May-01	238	553	183	508	3.0	22.7	0.0
Jun-01	199	341	136	248	1.8	26.8	0.0
Jul-01	199	346	160	265	0.0	25.1	0.0
Aug-01	197	391	160	322	0.0	13.2	0.0
Sep-01	203	328	177	305	2.7	1.0	42.0
Oct-01	214	377	168	315	4.1	0.0	23.6
Nov-01	206	362	142	301	3.1	23.6	0.0
Dec-01	192	393	120	243	2.0	4.7	0.0
Jan-02	198	427	108	261	10.3	22.6	5.5
Feb-02	213	385	96	198	3.9	4.9	0.0
Mar-02	150	345	64	189	1.8	10.4	0.0
Apr-02	158	412	85	212	0.0	14.5	0.0
May-02	206	568	131	366	23.2	34.8	40.7
Jun-02	224	447	114	321	4.2	17.2	0.0
Jul-02	284	1050	134	326	6.3	25.6	5.8
Aug-02	198	453	94	175	1.6	24.2	0.0
Sep-02	183	508	96	213	1.6	28.6	4.4
Oct-02	221	439	127	362	2.2	39.1	5.4
Nov-02	184	414	99	219	0.0	39.7	3.4
Dec-02	307	494	246	428	1.6	32.1	0.0
Jan-03	208	436	162	390	4.8	44.8	4.9
Feb-03	246	423	186	355	4.6	22.0	0.0
Mar-03	309	486	216	338	6.0	25.6	0.0
Apr-03	389	603	293	487	8.0	36.3	0.0
May-03	387	859	264	564	9.0	5.1	0.0
Jun-03	442	615	229	395	11.6	3.1	0.0
Jul-03	395	653	208	452	4.8	6.9	0.0
Aug-03	412	603	129	436	2.0	5.8	0.0
Sep-03	407	760	243	458	0.0	3.2	0.0
Oct-03	456	651	276	391	0.0	3.6	0.0
Nov-03	392	695	203	329	12.8	5.0	0.0
Dec-03	426	612	236	479	3.7	2.4	0.0
Jan-04	385	611	242	472	1.5	6.1	0.0
Feb-04	375	519	316	465	3.5	11.5	0.0
Mar-04	444	658	324	519	2.5	3.4	0.0
Apr-04	340	512	268	446	8.3	7.7	0.0
May-04	405	638	253	447	2.4	0.0	11.2
Jun-04	346	605	238	387	1.2	0.0	3.6
Jul-04	405	619	257	405	0.0	0.0	10.2
Min	150	328	64	175	0.0	0.0	0.0
Avg	291	526	190	367	4.3	18.8	3.8
Max	456	1050	324	564	23.2	85.3	42.0

**Permit
Limits:**

Min	-	-	-	-	-	-	-
Avg	-	-	273	-	-	-	-
Max	-	-	-	492	-	-	-

Table 2 - Discharge Monitoring Report Summary, Outfall 003 - Solar Grade Silicon, 1/01 to 7/04

Date	Flow (gpd)		pH (s.u.)		Cond (µmhos/cm)		Temp (°F)		TDS (mg/L)	
	Avg	Max	Min	Max	Min	Max	Avg	Max	Avg	Max
Jan-01	355,916	411,865	9.0	9.5	600	800	65	72	453	508
Feb-01	327,212	384,486	8.4	9.2	550	750	65	70	421	528
Mar-01	376,795	423,017	8.8	9.2	400	1,000	67	71	504	1,320
Apr-01	402,264	507,501	8.7	9.2	650	850	71	77	460	580
May-01	432,719	532,850	8.4	9.7	450	850	73	82	521	632
Jun-01	425,441	652,800	7.8	9.5	100	800	76	80	565	1,120
Jul-01	417,464	477,150	9.0	9.5	100	800	79	82	474	604
Aug-01	409,073	446,500	8.8	9.2	100	850	80	84	567	1,272
Sep-01	320,285	392,595	9.1	9.2	800	800	76	80	494	556
Oct-01	271,483	348,125	8.8	9.1	600	750	69	75	481	748
Nov-01	260,576	346,270	8.4	9.0	613	700	66	71	386	520
Dec-01	349,177	401,750	8.5	9.1	350	700	59	65	370	464
Jan-02	398,406	536,100	8.7	9.1	200	650	64	66	259	336
Feb-02	152,505	447,600	8.7	9.1	500	650	64	67	270	360
Mar-02	173,782	241,740	8.7	9.2	500	550	60	65	212	296
Apr-02	175,382	278,870	8.3	9.1	500	500	64	68	230	384
May-02	176,234	263,948	8.5	9.0	400	600	69	76	236	268
Jun-02	305,431	354,678	8.5	9.0	400	550	76	82	259	292
Jul-02	224,006	339,134	8.8	9.2	400	600	79	83	304	356
Aug-02	228,321	264,090	8.8	9.1	400	700	76	79	289	320
Sep-02	261,212	256,620	8.8	9.1	200	600	77	82	292	332
Oct-02	186,769	423,246	8.8	9.2	450	550	70	78	276	320
Nov-02	122,008	180,638	8.7	9.2	400	650	62	66	257	304
Dec-02	218,354	387,525	7.0	9.0	550	800	64	70	355	412
Jan-03	247,386	354,520	8.3	8.8	700	800	62	65	392	444
Feb-03	297,322	410,999	8.4	9.0	700	900	63	66	441	468
Mar-03	310,535	357,790	8.4	8.7	800	900	66	69	432	472
Apr-03	290,512	354,388	7.9	8.6	86	900	69	74	459	540
May-03	293,767	567,347	8.4	9.1	666	815	75	81	494	524
Jun-03	209,762	239,715	7.9	8.9	621	839	80	85	404	448
Jul-03	282,072	385,586	8.6	9.1	84	928	82	86	519	636
Aug-03	348,526	462,893	8.6	9.0	14	823	81	84	495	548
Sep-03	331,799	415,630	8.3	8.9	455	792	76	81	475	548
Oct-03	222,774	410,150	8.5	8.8	83	892	70	78	503	588
Nov-03	144,172	186,190	8.6	8.8	216	998	59	62	501	600
Dec-03	107,623	169,600	8.5	8.8	458	872	58	63	433	620
Jan-04	87,891	163,035	8.3	8.8	543	1,120	57	63	569	800
Feb-04	74,197	100,767	8.5	8.9	997	1,203	59	63	768	944
Mar-04	153,642	265,452	8.1	9.0	872	1,102	63	67	653	756
Apr-04	180,753	254,280	8.2	9.2	757	1,050	67	72	489	624
May-04	157,143	340,270	8.5	9.3	589	1,030	72	76	544	720
Jun-04	264,955	365,830	8.2	9.2	729	898	76	83	612	712
Jul-04	307,716	473,490	8.4	9.4	659	1,119	80	83	727	868
Min	74,197	100,767	7.0	8.6	14	500	57	62	212	268
Avg	262,404	362,257	8.5	9.1	471	815	69	74	438	574
Max	432,719	652,800	9.1	9.7	997	1,203	82	86	768	1,320

Permit

Limits:

Min	-	-	6.5	-	-	-	-	-	-	-
Avg	-	-	-	-	-	-	-	-	-	-
Max	-	-	-	9.5	-	-	-	-	-	2,500

** - No Detectable Amount

Table 2 - Discharge Monitoring Report Summary, Outfall 003 - Solar Grade Silicon, 1/01 to 7/04

Date	Oil & Grease (mg/L)		Chlorine Resid (µg/L)		Arsenic (µg/L)	Copper (µg/L)	Lead (µg/L)
	Avg	Max	Avg	Max			
Jan-01	0.0	0.0	8.4	0.0	2.5	4.9	0.0
Feb-01	0.0	0.0	12.4	0.0	2.9	3.4	0.0
Mar-01	0.6	2.2	13.2	0.0	9.2	3.6	0.0
Apr-01	1.4	2.8	19.3	0.0	1.9	7.2	0.0
May-01	0.5	3.7	27.0	0.0	1.4	7.4	0.0
Jun-01	0.0	0.0	22.0	0.0	0.0	4.8	0.0
Jul-01	0.0	0.0	18.2	0.0	1.0	0.0	4.4
Aug-01	0.0	0.0	0.0	11.9	1.6	6.3	0.0
Sep-01	0.0	0.0	9.1	214.0	1.1	2.2	0.0
Oct-01	0.0	0.0	2.2	66.0	1.2	2.9	0.0
Nov-01	0.0	0.0	0.0	0.0	2.3	1.8	0.0
Dec-01	0.0	0.0	0.0	0.0	3.8	3.9	0.0
Jan-02	0.3	1.4	4.4	0.0	5.8	2.7	0.0
Feb-02	0.0	0.0	7.4	0.0	1.6	3.4	0.0
Mar-02	1.0	2.2	7.7	0.0	1.7	5.4	0.0
Apr-02	0.5	3.1	13.0	0.0	0.0	8.8	0.0
May-02	0.2	1.4	26.1	10.7	3.7	6.3	0.0
Jun-02	0.0	0.0	16.8	0.0	0.5	5.4	0.0
Jul-02	0.4	1.8	14.0	0.0	1.1	8.4	0.0
Aug-02	1.2	1.7	2.4	0.0	1.1	9.4	0.0
Sep-02	0.9	2.2	0.0	0.0	0.0	7.8	1.2
Oct-02	1.7	4.1	0.7	0.0	0.0	10.3	1.6
Nov-02	1.9	7.6	0.0	0.0	0.0	10.5	1.5
Dec-02	0.8	3.0	0.8	0.0	2.2	8.1	1.3
Jan-03	0.5	2.7	0.0	0.0	8.2	9.0	1.1
Feb-03	2.0	4.7	0.0	0.0	11.7	4.3	0.0
Mar-03	1.9	4.9	2.5	0.0	10.9	5.3	0.0
Apr-03	1.9	6.6	11.1	0.0	11.3	3.5	0.0
May-03	0.7	2.8	0.0	0.0	9.2	6.3	0.0
Jun-03	0.0	0.0	0.0	0.0	1.2	5.9	0.0
Jul-03	0.3	1.6	0.0	0.0	2.0	3.8	0.0
Aug-03	0.0	0.0	0.0	0.0	0.0	4.0	0.0
Sep-03	0.5	2.0	0.0	0.0	1.0	5.3	0.0
Oct-03	1.5	5.6	0.5	0.0	0.0	2.5	0.0
Nov-03	3.5	9.2	0.5	0.0	2.3	5.4	0.0
Dec-03	1.5	3.9	0.0	0.0	1.0	3.4	0.0
Jan-04	0.0	0.0	7.0	0.0	2.5	2.7	0.0
Feb-04	2.9	5.8	4.5	0.0	5.2	5.3	0.0
Mar-04	0.0	0.0	0.0	0.0	9.8	5.6	0.0
Apr-04	1.3	5.3	0.0	0.0	9.9	2.7	0.0
May-04	0.4	1.6	0.0	0.0	4.4	3.5	0.0
Jun-04	0.0	0.0	0.0	0.0	2.0	5.4	0.0
Jul-04	0.0	0.0	0.0	0.0	1.9	4.2	0.0
Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Avg	0.7	2.2	5.8	7.0	3.3	5.2	0.3
Max	3.5	9.2	27.0	214.0	11.7	10.5	4.4

Permit							
Limits:							
Min	-	-	-	-	-	-	-
Avg	-	-	7.2	-	-	-	-
Max	-	**	-	18.2	50	-	-

** - No Detr

Table 3 - City of Moses Lake, Dunes Treatment Plant Effluent Flow and TDS, January, 2001 to August, 2004

Date	Flow (mgd)		TDS	
	Avg	Max	mg/L	lbs/day
Jan-01	1.81	1.89	603	9,077
Feb-01	1.83	2.15	590	8,995
Mar-01	1.87	1.98	632	9,862
Apr-01	2.12	2.22	599	10,566
May-01	2.17	2.31	601	10,857
Jun-01	2.19	2.30	583	10,634
Jul-01	2.19	2.32	618	11,308
Aug-01	2.26	2.43	560	10,555
Sep-01	2.22	2.35	576	10,641
Oct-01	2.14	2.31	564	10,061
Nov-01	1.88	2.14	534	8,386
Dec-01	1.87	2.01	555	8,633
Jan-02	1.87	1.98	549	8,539
Feb-02	1.90	2.05	566	8,955
Mar-02	1.90	2.01	535	8,478
Apr-02	2.00	2.18	561	9,348
May-02	2.03	2.13	557	9,407
Jun-02	2.06	2.19	612	10,504
Jul-02	2.16	2.33	584	10,516
Aug-02	2.15	2.41	585	10,495
Sep-02	2.10	2.24	576	10,093
Oct-02	2.10	2.26	603	10,571
Nov-02	1.93	2.07	536	8,641
Dec-02	1.92	2.16	575	9,212
Jan-03	1.99	2.15	581	9,643
Feb-03	1.98	2.15	589	9,726
Mar-03	1.87	2.07	583	9,097
Apr-03	2.05	2.26	628	10,747
May-03	1.99	2.23	593	9,827
Jun-03	1.93	2.07	582	9,349
Jul-03	1.96	2.08	582	9,528
Aug-03	2.03	1.94	676	11,434
Sep-03	2.04	2.15	604	10,271
Oct-03	1.96	2.16	614	10,026
Nov-03	1.80	2.02	587	8,807
Dec-03	1.74	1.84	588	8,528
Jan-04	1.81	1.93	656	9,881
Feb-04	1.84	2.02	595	9,141
Mar-04	1.82	1.91	628	9,522
Apr-04	1.91	2.14	643	10,253
Apr-04	1.90	2.10	643	10,189
May-04	1.97	2.16	630	10,351
Jun-04	1.91	1.99	612	9,749
Jul-04	1.98	2.09	613	10,123
Aug-04	2.04	2.19	628	10,690
Min	1.74	1.84	534	8,386
Avg	1.98	2.13	594	9,805
Max	2.26	2.43	676	11,434

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on August 9 and 16, 2000 in the Columbia Basin Herald to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on October 1, 2004 in the Columbia Basin Herald to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Eastern Regional Office
4601 North Monroe Street
Spokane, WA 99205-1295

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (509) 329-3400, or by writing to the address listed above.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART-- An acronym for “all known, available, and reasonable methods of treatment”.

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring --Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantification Level (QL)-- A calculated value five times the MDL (method detection level).

Responsible Corporate Officer-- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

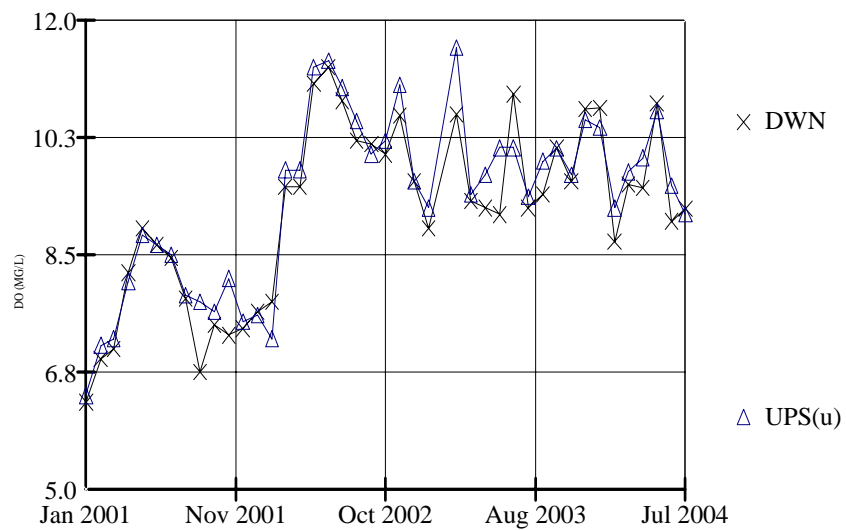
Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--RECEIVING WATER MONITORING RESULTS/TECHNICAL CALCULATIONS

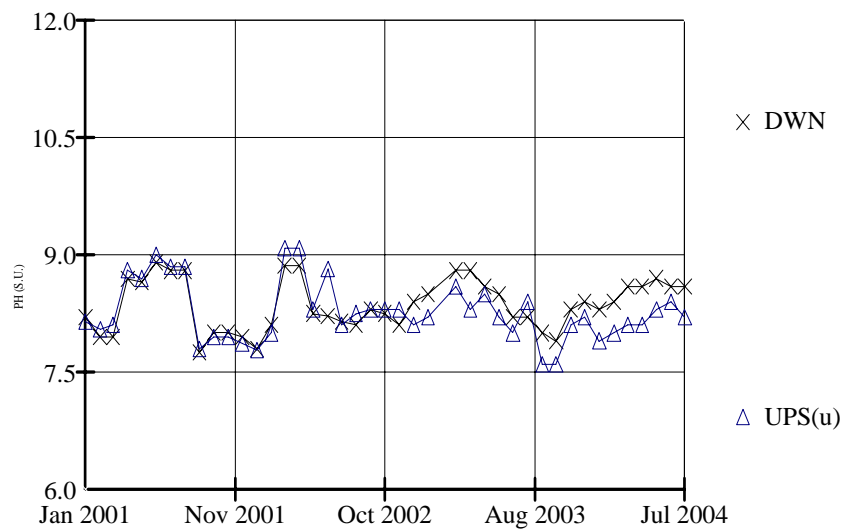
Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at <http://www.ecy.wa.gov>.

TIME SERIES



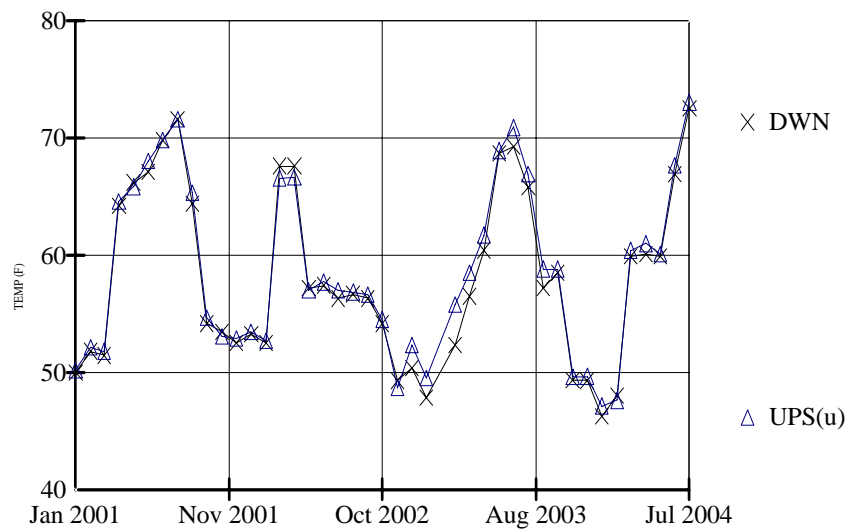
Constituent: DO (MG/L) Facility: Landfill X Data File: SGS_SW
Date: 9/23/04, 3:21 PM Client: Regulatory Use View: data

TIME SERIES



Constituent: PH (S.U.) Facility: Landfill X Data File: SGS_SW
Date: 9/23/04, 3:22 PM Client: Regulatory Use View: data

TIME SERIES



Constituent: TEMP (F) Facility: Landfill X Data File: SGS_SW
Date: 9/23/04, 3:22 PM Client: Regulatory Use View: data

Time Series

Constituent: Multiple Facility: Landfill X Data File: SGS_SW

Date: 9/23/04, 3:23 PM Client: Regulatory Use View: data

Date	DO (MG/L)		PH (S.U.)		TEMP (F)	
	DWN	UPS*	DWN	UPS*	DWN	UPS*
01/01/01	6.3	6.4	8.2	8.15	50	50.18
02/01/01	6.95	7.15	7.95	8.05	51.8	52.16
03/01/01	7.1	7.25	7.95	8.1	51.44	51.8
04/01/01	8.23	8.1	8.69	8.81	64.22	64.58
05/01/01	8.89	8.8	8.65	8.7	66.2	65.84
06/01/01	8.65	8.65	8.9	9	67.1	68
07/01/01	8.45	8.5	8.8	8.85	69.8	69.8
08/01/01	7.85	7.9	8.8	8.85	71.6	71.6
09/01/01	6.75	7.8	7.75	7.8	64.4	65.3
10/01/01	7.46	7.65	8.01	7.95	54.14	54.68
11/01/01	7.3	8.15	8.01	7.95	53.42	53.06
12/01/01	7.4	7.5	7.95	7.87	52.52	52.88
01/01/02	7.65	7.6	7.8	7.78	53.24	53.42
02/01/02	7.8	7.25	8.1	8	52.5	52.7
03/01/02	9.52	9.77	8.86	9.09	67.6	66.56
04/01/02	9.52	9.77	8.86	9.09	67.6	66.6
05/01/02	11.05	11.3	8.25	8.3	57.2	57
06/01/02	11.3	11.4	8.22	8.82	57.4	57.7
07/01/02	10.8	11	8.15	8.1	56.3	57
08/01/02	10.2	10.5	8.1	8.25	56.66	56.84
09/01/02	10.15	10	8.3	8.3	56.3	56.6
10/01/02	10	10.2	8.25	8.3	54.14	54.5
11/01/02	10.58	11.04	8.1	8.3	49.28	48.7
12/01/02	9.6	9.6	8.4	8.1	50.36	52.34
01/01/03	8.9	9.2	8.5	8.2	47.8	49.5
03/01/03	10.6	11.6	8.8	8.6	52.34	55.76
04/01/03	9.3	9.4	8.8	8.3	56.48	58.46
05/01/03	9.2	9.7	8.6	8.5	60.4	61.7
06/01/03	9.1	10.1	8.5	8.2	68.7	68.9
07/01/03	10.9	10.1	8.2	8	69.26	70.88
08/01/03	9.2	9.37	8.2	8.4	65.8	66.9
09/01/03	9.4	9.9	8	7.6	57.2	58.8
10/01/03	10.1	10.09	7.9	7.6	58.5	58.8
11/01/03	9.6	9.7	8.3	8.1	49.3	49.6
12/01/03	10.68	10.51	8.4	8.2	49.28	49.64
01/01/04	10.7	10.4	8.3	7.9	46.22	47.12
02/01/04	8.7	9.2	8.4	8	48	47.6
03/01/04	9.55	9.74	8.6	8.1	59.9	60.4
04/01/04	9.5	9.95	8.6	8.1	60.08	60.98
05/01/04	10.76	10.65	8.7	8.3	59.9	60.08
06/01/04	9	9.53	8.6	8.4	66.92	67.64
07/01/04	9.19	9.11	8.6	8.2	72.5	73.04

Asterisk indicates background data.

v.8.5.09. For regulatory purposes only. CAS# n/a

Sanitas™

Effluent and Receiving Water Critical Conditions

Facility: **Solar Grade Silicon**
Receiving Water: **Drain DE-226**

Design Case: **Permit Determinations**

Effluent Data				Receiving Water Data			%flow for dilution
CLICK HERE FOR INSTRUCTIONS	Annual Average	Monthly Average	Daily Maximum	7Q10 Critical	30Q5 Critical	Harmonic	
	Flow	Flow	Flow	Flow	Flow	Mean Flow	
Flow (MGD)	0.26	0.43	0.65	0.00	0.00	0.00	0
(cfs)	0.41	0.67	1.01	0.00			
Critical Temp (°C)	30.00			16.00			
(°F)	86.0			60.8			
Critical Hardness (mg/L CaCO3)	100.00	← Effluent Data		100.00	← Receiving Water Data		
Critical pH (s.u.)	9.50			8.50			
Critical Alkalinity (mg/L as CaCO3)	193.80			50.00			
Enter own pH & Temp for Ammonia Criteria?	n			Enter own Dilution Factors (DFs)?			n
	pH	Temp (°C)					
@ Acute Boundary							
@ Chronic Boundary							
	@ Acute Boundary	@ Chronic Boundary	Whole River Dilution (@ 7Q10 Flow)	@ 30Q5 River Flow (non C)	@ Harmonic Mean River Flow (Carcn)		
Dilution Factor	1.00	1.00	1.00	1.00	1.00		
(% effluent)	100.00	100.00	100.00	100.00	100.00		
Hardness	100.00	100.00	100.00	-	-		
Alkalinity	193.80	193.80	193.80	-	-		
Max pH (s.u.)	9.50	9.50	9.50	-	-		
Max Temp (°C)	30.00	30.00	30.00	-	-		
Max Temp (°F)	86.00	86.00	86.00	-	-		

Pollutant, Effluent, and Receiving Water Data

Facility Solar Grade Silicon
 Receiving Water Drain DE-226
 Design Case Permit Determinations

Pollutant, CAS No. & Application Ref. No.	priority pollutant?	standard	Freshwater Quality Criteria		Metals Translators		Probability (0.95 - WQ Based; 0.5 - Human Health)	Enter Effluent Data					Enter RW Data
			acute ug/L	chronic ug/L	acute	chronic		max effluent concentration ug/L	# of data points	Coefficient of Variation	#samples per month for compliance monitoring	50% percentile effluent conc for HH RPD, when n>10 (leave blank otherwise) ug/L	Ambient Concentration ug/L
ARSENIC (dissolved) 7440382 2M	Y	WQ Stnd	360.0	190.0	1.0	1.0	0.95	12.2	43	0.6	1		
ARSENIC (inorganic)	Y	HH-Carcn	HH	0.018	0.0	0.0	0.5	12.2	43	0.6	1		
CHLORINE (Total Residual) 7782505	N	WQ Stnd	19.0	11.0	0.0	0.0	0.95	400.0	1	0.6	20		
COPPER** - 744058 6M	Y	WQ Stnd	17.0	11.4	0.996	0.996	0.95	9.3	43	0.6	1		
LEAD** - 7439921 7M	Y	WQ Stnd	64.6	2.517	0.466	0.466	0.95	3.7	43	0.6	1		
ZINC** - 7440666 13M	Y	WQ Stnd	114.4	104.5	0.996	0.996	0.95	13.0	1	0.6	1		

** - Criteria dependent on hardness

**Summary of Effluent Reasonable Potential
Determination & Limits**

Facility
Receiving Water
Design Case
Solar Grade Silicon
Drain DE-226
Permit Determinations

POLLUTANT	priority pollutant?	standard	Maximum Expected (or 50%) Effluent Concentration, µg/L	Does reasonable potential exist?	Receiving Water	Acute Boundary		Chronic Boundary		Permit Limits	
					Upstream RW Conc, µg/L	RW Acute Criteria, µg/L	Conc @ Acute MZ Boundary, µg/L	RW Chronic (or Human Health) Criteria, µg/L	Conc @ Chronic (or Human Health) MZ Boundary, µg/L	Daily Maximum Limit, µg/L	Monthly Average Limit, µg/L
ARSENIC (dissolved) 7440382 2M	Y	WQ Stnd	13.2	NO	0.0	360.0	13.2	190.0	13.2		
ARSENIC (inorganic)	Y	HH-Carcn	5.322	YES	0.0	HH		0.018	5.322	0.026	0.018
CHLORINE (Total Residual) 7782505	N	WQ Stnd	2479.1	YES	0.0	19.0	2479.1	11.0	2479.1	18.1	7.163
COPPER** - 744058 6M	Y	WQ Stnd	10.1	NO	0.0	17.0	10.1	11.4	10.1		
LEAD** - 7439921 7M	Y	WQ Stnd	4.018	NO	0.0	64.6	1.872	2.517	1.872		
ZINC** - 7440666 13M	Y	WQ Stnd	80.6	NO	0.0	114.4	80.2	104.5	80.2		

** - Criteria dependent on hardness

APPENDIX D--RESPONSE TO COMMENTS

The Department received comments on the proposed permit from the East Columbia Basin Irrigation District and the Bureau of Reclamation. The following pages contain the comment letters and the Department's response to each comment. The Department considered these comments and made changes to the final permit, as determined appropriate.

Note: In reviewing the draft permit, the Department found a typographical error on footnote 'c' for pH for permit condition S1.A. This erroneous footnote read:

"Indicates the range of permitted values. When pH is continuously monitored, excursions between 5.0 and 6.0, or 9.0 and 10.0 shall not be considered violations provided no single excursion exceeds 60 minutes in length and total excursions do not exceed 7 hours and 30 minutes per month. Any excursions below 5.0 and above 10.0 are violations. The instantaneous maximum and minimum pH shall be reported monthly."

This should have read:

"Indicates the range of permitted values. When pH is continuously monitored, excursions between 5.0 and 6.0, or 9.5 and 10.5 shall not be considered violations provided no single excursion exceeds 60 minutes in length and total excursions do not exceed 7 hours and 30 minutes per month. Any excursions below 5.0 and above 10.5 are violations. The instantaneous maximum and minimum pH shall be reported monthly."

This applicable footnote has been corrected in the final permit. The Department also found that a monitoring frequency for arsenic at outfall 003 was not specified in the draft permit. The final permit contains a monitoring frequency for arsenic at once per month from a 24 hour composite sample (the same as in the previous permit).

**COMMENTS TO NPDES PERMIT WA-004524-1, SOLAR GRADE
SILICON, LLC**

RESPONSES

EAST COLUMBIA BASIN IRRIGATION DISTRICT

55 North 8th
P.O. Box E

OTHELLO, WASHINGTON 99344

Phone 509 488 9671
Fax 509 488 6433

October 15, 2004

Mr. Lenox Bramble, P.E., Permit Unit Supervisor
Water Quality Section
Washington Department of Ecology
North 4601 Monroe Street
Spokane, WA 99205-1295

RE: Draft NPDES Permit No. WA-004524-1

Dear Mr. Bramble:

This letter is written to object to Ecology's issuance of the referenced NPDES permit for Outfall 003 – Discharge to Drain DE226.

As the draft permit correctly states, the receiving water body is a Columbia Basin Project constructed drain owned by the U.S. Bureau of Reclamation. This drain has been transferred to the East Columbia Basin Irrigation District for operation and maintenance. This drain is intended for the conveyance of Columbia Basin Project operational spills and agricultural irrigation drain water. It is not intended for industrial wastewater.

1

The District realizes that this discharge has been in place and in use for a number of years. The District also realizes that the NPDES permit only authorizes the discharge of cooling water. However, neither the East District nor the Bureau of Reclamation have ever given permission for the installation or operation of this drain inlet to the DE 226.

2

Ecology lacks authority to issue NPDES permits for the discharge of industrial wastewater, of any kind, to Columbia Basin Project facilities. This permit should not be issued.

The draft permit also correctly states that the DE226 drain is tributary to the Rocky Coulee Drain. Rocky Coulee Drain is then tributary to Potholes Reservoir, which is the source of irrigation water for over 200,000 acres in the South and East Columbia Basin Projects.

3

Rocky Coulee Drain appears twice on Ecology's draft 2002/2004 Water Quality Assessment. Both listings are category 5 (the 303(d) list) and both are for high pH. The listing numbers are 16150 and 16145. On page 6 of 29 of the draft NPDES permit the pH for the wastewater from Outfall 003 is stated to range between 7.0 and 9.7. This would seem to worsen the pH situation for the Rocky Coulee Drain.

4

If Ecology can make a determination that it is permissible for an industrial discharger to increase the pH of a Columbia Basin Project facility, then Ecology should rescind all its proposed 303(d) listings for pH for all Columbia Basin Project waterways.

1. Comment noted. A condition has been added to the final permit that requires the Permittee to provide a copy of the agreement between the Permittee and the Bureau of Reclamation/Irrigation Districts for the discharge to drain DE 226. The Department hopes that the Permittee also realizes the need for the authorization, and works toward obtaining this agreement.


2. The Department believes that waters within the Columbia Basin Project are waters of the State, and subject to the protection of the Clean Water Act. This includes the issuance of NPDES permits for the discharge of pollutants into waters of the State.

3. As a note, the 2002/2004 303(d) list is still draft. Therefore, the applicable section of Rocky Coulee Drain, about 3.5 miles downstream from the discharge, is not an officially listed waterbody. Testing conducted upstream of the discharge on drain DE336 by the Permittee during the previous permit also noted pH above the water quality criteria of 8.5 s.u. It appears that high pH may be a systematic problem in the Rocky Coulee drain system.

The pH is elevated in the discharge because of the high pH of the City of Moses Lake supply water. Both the previous and proposed permit set the maximum pH level for Outfall 003 at 9.5 s.u. in consideration of the high pH of the supply water; and recognizing that pH adjustment would contribute additional dissolved solids to Outfall 003.

Existing Surface Water Quality (SWQ) Standards (1997 version) specify drain DE226 a class AA waterbody, with applicable pH criteria within the range of 6.5 to 8.5 s.u. As stated in the fact sheet, the State adopted amended SWQ Standards in July, 2003. These amended standards have not yet been approved by the Environmental Protection Agency (EPA) and hence cannot be used for any Federal related permit decisions. The July 2003 SWQ Standards would change the characteristic uses of drain DE226. However, criteria for pH for these new characteristic uses would still be within the range of 6.5 to 8.5 s.u.

-continued on next page-

COMMENTS TO NPDES PERMIT WA-004524-1, SOLAR GRADE SILICON, LLC	RESPONSES
<p data-bbox="241 435 569 492">Mr. Lenox Bramble, P.E., Permit Supervisor October 15, 2004 Page 2</p> <p data-bbox="163 545 180 565">5</p> <p data-bbox="241 534 930 589">The District recommends a meeting with Ecology, Reclamation and all three Columbia Basin Projects irrigation districts be arranged to discuss this draft NPDES permit prior to any further action by Ecology.</p> <p data-bbox="680 651 753 670">Sincerely,</p> <div data-bbox="669 677 863 766">  Richard L. Erickson Secretary-Manager </div> <p data-bbox="241 784 285 800">RLE:ll</p> <p data-bbox="241 823 663 1016">cc: Bill Gray USBR Bruce Loranger, USBR Shannon McDaniel, SCBID Keith Franklin, QCBID Merle Gibbens, GCPHA Richard Lemargie, CBPIDs Jim Bellatty, Ecology Dave Knight, Ecology Kent Stephens, Solar Grade Silicon, LLC Terry Cummings, Advanced Silicon Materials, Inc.</p>	<p data-bbox="1064 318 1980 513">3. (-continued from previous page-) Considering the likelihood of the 303(d) listing of Rocky Coulee Drain and that the amended WQS will still retain a criteria range for pH within 6.5 to 8.5 s.u., the Department has modified the permit limit for outfall 003 to within the range of 6.5 to 8.5 s.u. A two year schedule of compliance for meeting this limitation will be included in the final permit.</p> <p data-bbox="1064 542 1955 605">4. Comment noted. The requirements and conditions in this permit will not affect the Department's 303(d) listing process.</p> <p data-bbox="1064 634 1976 729">5. The Department believes that the comments directly related to permit conditions and requirements have been addressed in the final permit. See also response to Comment #1.</p>

COMMENTS TO NPDES PERMIT WA-004524-1, SOLAR GRADE SILICON, LLC

RESPONSES



United States Department of the Interior

BUREAU OF RECLAMATION
Ephrata Field Office
P. O. Box 815
Ephrata, Washington 98823

OCT 27 2004

EPH-2604
ENV-8.00

OCT 25 2004

Mr. Lennox Bramble, P.E.
Permit Unit Supervisor
Washington Department of Ecology
4601 North Monroe Street
Spokane, WA 99205-1295

Subject: Draft National Pollutant Discharge Elimination System (NPDES), Advanced Silicon Materials, Inc., Permit No. WA-004524-1, Columbia Basin Project, Washington

Dear Mr. Bramble:

The Bureau of Reclamation is opposed to issuance of the subject permit for outfall 003, discharge to the Rocky Coulee Wasteway through the DE226 Drain.

The DE226 Drain is a federally owned and operated irrigation facility within the Columbia Basin Project (Project). This facility is part of the East Columbia Basin Irrigation District which, by contractual agreement, operates and maintains a portion of the Project irrigation facilities. The DE226 Drain was constructed to capture operational spills and agricultural irrigation drain water from surrounding farm units. Industrial wastewater discharge is not an identified Project purpose authorized by the United States Congress.

6 On October 21, 1997, this office provided Advanced Silicon Materials, Inc. a letter outlining six requirements for the use of the DE226 and the Rocky Coulee Wasteway. This letter was also forwarded to your office and the two affected irrigation districts. We have enclosed a copy for your convenience. None of the six requirements have been met to date.

7 Reclamation has since established a policy for wastewater discharges to our facilities. The Department of Ecology (Ecology) acknowledged this policy in the fact sheet provided with the subject permit and provided a summary of items within the policy. We note that the only item considered when issuing this permit was the requirement for no mixing zones to meet toxic water quality criteria.

8 Furthermore, the fact sheet states that Chapter 173-36 Washington Administrative Code (WAC), Columbia Basin Irrigation Area – Sewage and Waste, contains established discharge limitations. The proposed permit does not follow these limits. Section WAC 173-36-040 item (5) states:

8 "No salts or elements injurious to crops, soils or animals – aluminum, boron, arsenic, selenium, lead, manganese, etc." yet the permit allows for a maximum daily discharge of 50 µ/L of arsenic.
9 The range for pH is stated as "(6) No wastes with a pH less than 6.5 or greater than 8.5." but the proposed permit will allow for a discharge with a "Daily minimum equal to or greater than 6 and

6. The permit does not relieve the Permittee from compliance with any applicable federal, state, or local statute. The Department is aware that an authorization from the Bureau of Reclamation and downstream Irrigation Districts may be needed for the Permittee's discharge to drain DE 226. A condition has been added to the final permit that requires the Permittee to provide a copy of this authorization, within one year after the issuance date of this permit. If this authorization has not been finalized at that time, an update on the status of obtaining this authorization is required.

7. This is correct. See Response to Comment #6.

8. Arsenic in the Permittee's discharge is likely from arsenic contained in the water supplied to the facility from the City of Moses Lake. Further, windblown dust may also contribute trace levels of arsenic to the effluent discharge. The proposed permit set a limit for arsenic based on the limitation from the previous permit. This is more stringent than recommended maximum concentration of arsenic in irrigation waters of 100 µg/L¹. Therefore, the Department believes a 50 µg/L limit for the discharge should be protective for any downstream waters used for irrigation.

9. See response to comment #3. The final permit contains a two year compliance schedule for meeting the new pH limitation of 6.5 to 8.5 s.u. By adjusting effluent pH within this range, additional dissolved solids may be discharged. However, the Department believes the Permittee will be able to continue to meet the total dissolved solids limit of 2,500 mg/L. An interim pH limitation for outfall 003 will set to within the range of 6.0 to 9.5 s.u.

¹Metcalf & Eddy, 1991. Wastewater Engineering, Third Edition, Metcalf & Eddy, Inc., 1991.

COMMENTS TO NPDES PERMIT WA-004524-1, SOLAR GRADE SILICON, LLC	RESPONSES
<div data-bbox="898 332 919 349">2</div> <div data-bbox="100 375 898 423"> <p>9 (con'd)</p> <p>daily maximum less than or equal to 9.5". This clearly exceeds the allowed discharge limits as stated in Chapter 173-36 WAC.</p> </div> <div data-bbox="111 444 898 570"> <p>10</p> <p>Section G6 of the permit states: "Nothing in this permit shall be construed as excusing the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations." To comply with this section, Ecology needs to work in partnership with Reclamation and the three Columbia Basin Irrigation Districts in resolving these issues prior to issuing further discharge permits. Accordingly, we would like to propose meeting with you at the earliest convenient date for all parties to discuss these issues.</p> </div> <div data-bbox="205 591 903 633"> <p>We look forward to working with you. If you have any question or comments, please contact Bruce Loranger at 509-754-0210.</p> </div> <div data-bbox="394 654 869 800"> <p>Sincerely,</p> <p><i>William D. Gray</i></p> <p>ACTING FOR William D. Gray Deputy Area Manager</p> </div> <div data-bbox="201 839 283 860"> <p>Enclosure</p> </div> <div data-bbox="201 881 527 966"> <p>cc: Mr. Richard L. Erickson East Columbia Basin Irrigation District P.O. Box E Othello, WA 99334</p> </div> <div data-bbox="231 984 552 1071"> <p>Mr. Keith Franklin Quincy-Columbia Basin Irrigation District P.O. Box 188 Quincy, WA 98848</p> </div> <div data-bbox="231 1089 539 1175"> <p>Mr. Shannon McDaniel South Columbia Basin Irrigation District P.O. Box 1006 Pasco, WA 99301</p> </div> <div data-bbox="231 1193 428 1278"> <p>Mr. Kent Stephens Solar Grade Silicon, LLC 3322 Road N NE Moses Lake, WA 98837</p> </div> <div data-bbox="231 1297 480 1383"> <p>Mr. Terry Cummings Advanced Silicon Materials, Inc. 3322 Road N NE Moses Lake, WA 98837</p> </div>	<div data-bbox="1056 305 1726 337"> <p>10. Comment noted. See also response to Comment #6.</p> </div>